PolyGard® Controller LGC/LG2-04

Multi-Point Controller
Serial Number – S00

User Manual – Preliminary Version

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Multi Point Controller LGC/LG2-04

1 Description

The PolyGard® Multi Point Controller LGC/LG2-04 is used for the monitoring and warning of sensor point exceeding their stage setpoints. External Transmitters can monitor and warn of toxic, combustible and refrigerant gases as well as temperature and humidity. The Controller LGC/LG2-04 can measure up to 4 analog (Gas) Transmitters per EP module with 4 to 20 mA signals. Each Sensor Point (SP) can have five stage thresholds. Each stage threshold can be asigned to anyone of the relays (R1…R5). The Controller can interface via 4 to 20 mA outputs to any compatible electronic analog control, DDC/PLC control or automation system.

The adjustable parameters and staged thresholds make this system very flexible for sensor measuring and control.

The configuration of parameter settings and operation is easy to do without any programming knowledge.

PolyGard® Multi Point Controller LGC/LG2-04 must not be used in areas requiring explosion proof equipment.

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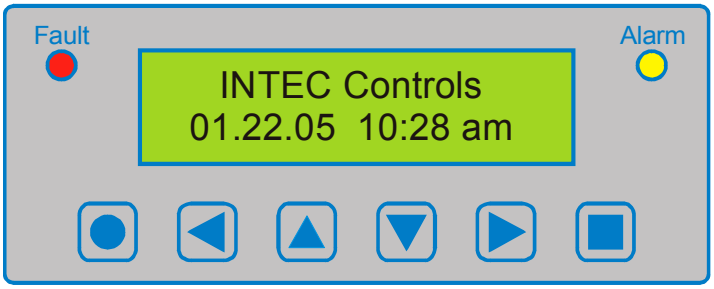
2 Operating Instruction

The complete configuration, parameterization and service are made via keypad user interface in combination with the display screen. Security is provided via two password levels.



2.1 Description Keypad User Interface

Exits programming and saves settings, returns to the previous menu level.

Enter sub menus, stores changed values.

Scrolls down & up in Main menu and Sub menus, increases or decreases a value.

Moves cursor left or right.

LED yellow Flashes when one or more stages have been exceeded or manual override of relays.

LED red: Flashes when System or Sensor Failure is detected or when Maintenance needed.

2.2 Setting / Change Parameters

Desired menu window open.

Opens menu window, if password approved the cursor jumps on the first position segment which can be changed.

Move the cursor to the segment position, which is to be changed.

Changes the parameter or values.

Saving the changed parameter or value.

Finish

2.3 Password Level

All changes of parameters and staged setpoint values are protected by four digit numeric Code (= password).

The code level 1 permits the operation of the LGC/LG2-04. This code level is intended for the customer. This code can be individually changed in System Setup Menu with valid Code 2 Password.

With the code level 2 all parameters and set points can be changed, this code level is reserved for the service technician.

A third code level permits activation or deactivation of sensor points (SP).

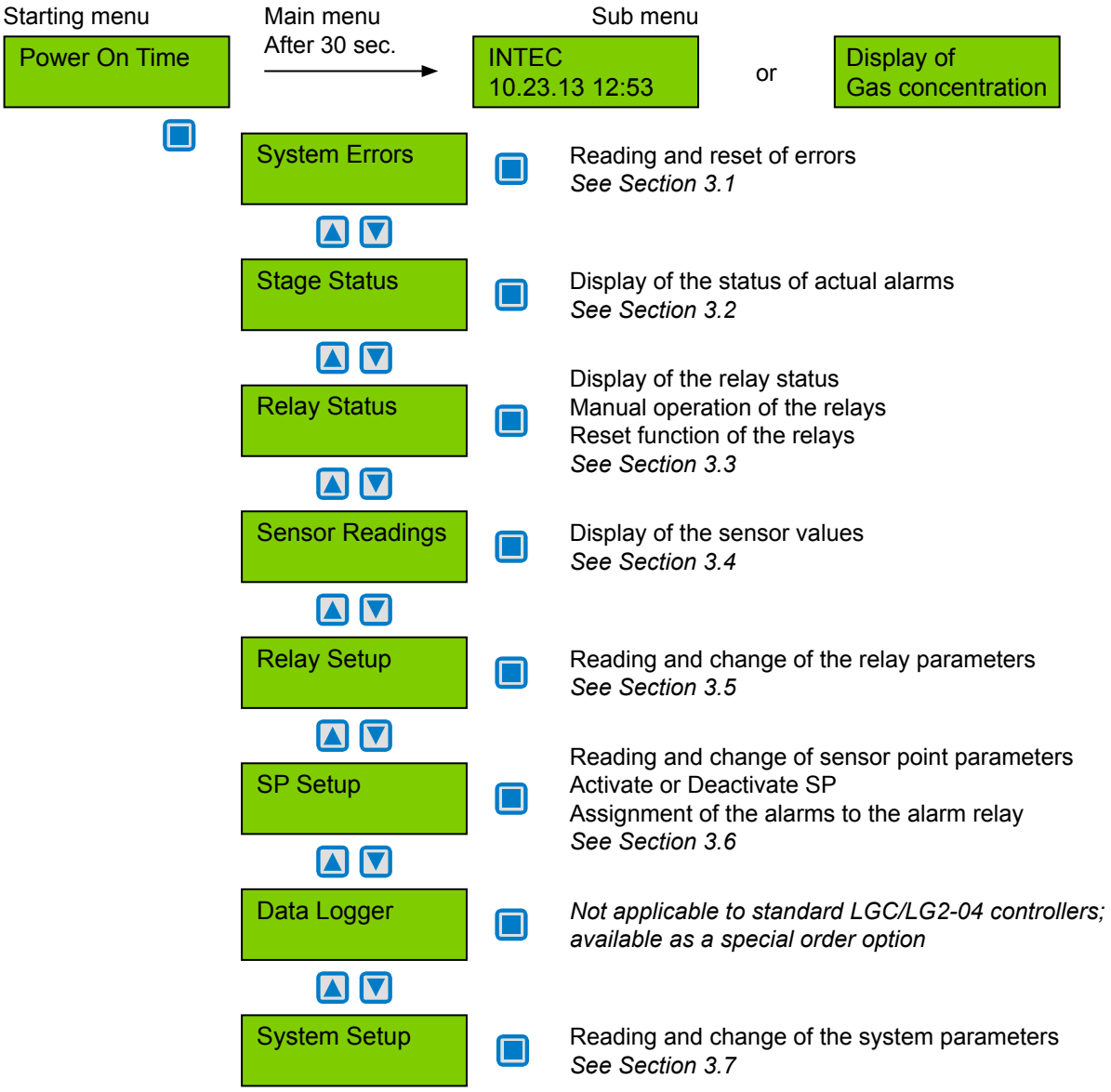
A password must be re-entered if 15 minutes goes by without the press of a push button.

All menu windows can be seen without a password required.

3 Menu Overview

The Multi Point Controller LGC/LG2-04 is operated via a simple and logical menu structure which is easy to learn. The operating menu contains the following levels:

- Starting menu with date and time if no SP is registered, otherwise scrolling display of the gas concentrations of all registered transmitters in 5-second intervals
- Main menu
- Submenu 1 and 2



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3.1 Malfunction management

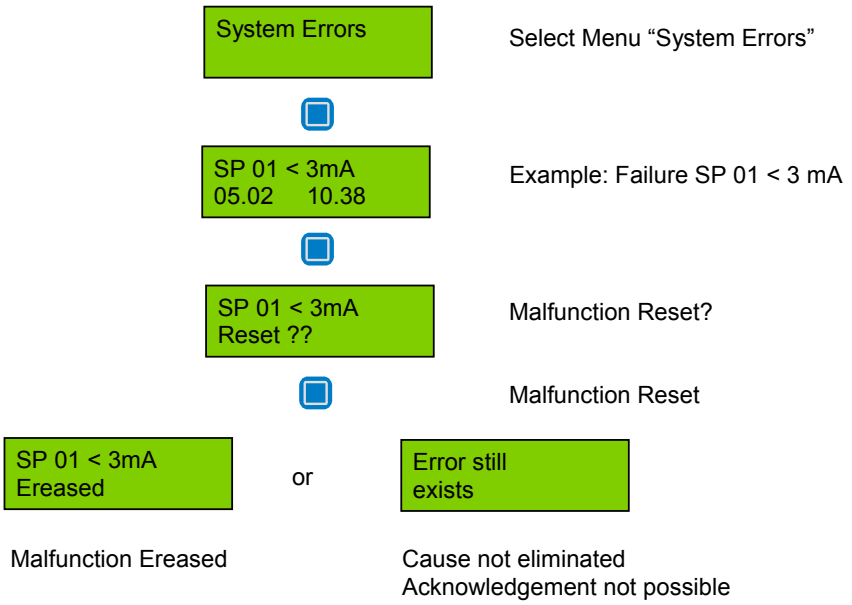
Malfunction management records the last 15 malfunctions with date and time stamps. In addition, “System Errors” are recorded in “Error Memory” when the malfunction occurs. This history can be selected and cleared only by the service technician level password.

A malfunction gets over laid on text message in the starting menu. When the failure happens a relay, which is defined in the system setup as „Failure relay“ is activated. The red LED in the front of the Controller flashes.

During the malfunction of a sensor point (SP) relays that are assigned for sensor are activated. These are defined in the menu „SP Setup“.

3.1.1 Acknowledge a malfunction

Attention:
Acknowledging of a malfunction is only possible after the removal of the cause.



3.1.2 History error summary

The code level 2 can open the menu “Hist Error Sum” in the main menu “System Errors”.

The last 20 malfunction error messages are listed for the service technician even if they have already been acknowledged. The deletion of each individual message occurs similar to the acknowledgement of a malfunction.

3.1.3 System Errors

Following System Error Message are recorded.

SP XX > 22 mA Current signal at analog Input XX > 22 mA.

Cause: Short-circuit at analog Input or Transmitter not calibrated, Transmitter defective.

Solution: Check cable to Transmitter, Make Calibration, Change the Transmitter.

SP XX < 3 mA Current signal to analog Input XX < 3 mA.

Cause: Wire break at analog Input or Transmitter not calibrated, Transmitter defective.

Solution: Check cable to Transmitter, Make Calibration, Change the Transmitter.

GC Error: Internal Communication Error I/O Board to LCD Board.

Cause: Internal Error.

Solution: Change the Controller.

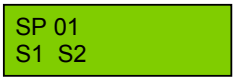
Maintenance: System maintenance is necessary.

Cause: Maintenance date exceeded.

Solution: Perform maintenance.

3.2 Stage Status

Display the actual stages exceeded in the sequence they happen. The sensor points are over laid where a stage has been exceeded. Changes are not possible in this menu.



Symbol	Description	Function
SP 01	Sensor Point (SP) Point No.	
SX	Stage Status	S1 = Stage 1 ON S2 = Stage 2 ON S3 = Stage 3 ON S4 = Stage 4 ON S5 = Stage 5 ON

3.3 Relay Status

Display the actual status of each relay. Manual operation of the relays.

Symbol	Description	Setting Status	Function
R 01	Relay No. 01		Select Relay No.
OFF	Status Relay	OFF	OFF = Relay Off (Not Activated by Stage Setpoint) ON = Relay On (Activated by Stage Setpoint) Manual OFF = Relay manual Off Manual ON = Relay manual On

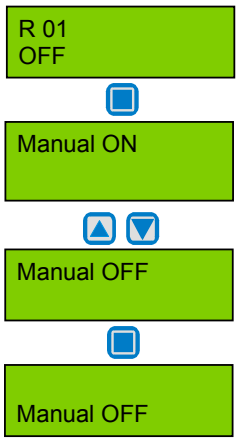
3.3.1 Manual operation of the relay

The manual operation of the relays occurs in the menu „Relay Status". If a relay is in the manual ON or OFF status, the yellow LED at the Controller is on continuously.

The external operation of the alarm relay over an assigned digital input has the priority before the manual operation in the menu "Relay Status" and exceeding the Stage set point assigned.

In the menu „Relay Status" any manually operated relays can be reset by selecting the "Automatic" mode.

Acknowledgment of the relays in Latching mode also is a function in this menu.



Select Relay

Select Function Manual operation

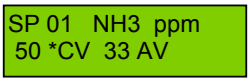
Select Function

Manual ON = Relay ON
Manual OFF = Relay OFF
Automatic = Automatic operation restored
Reset ? = Acknowledging Latching mode

Relay forced to OFF Condition

3.4 Menu Sensor Values

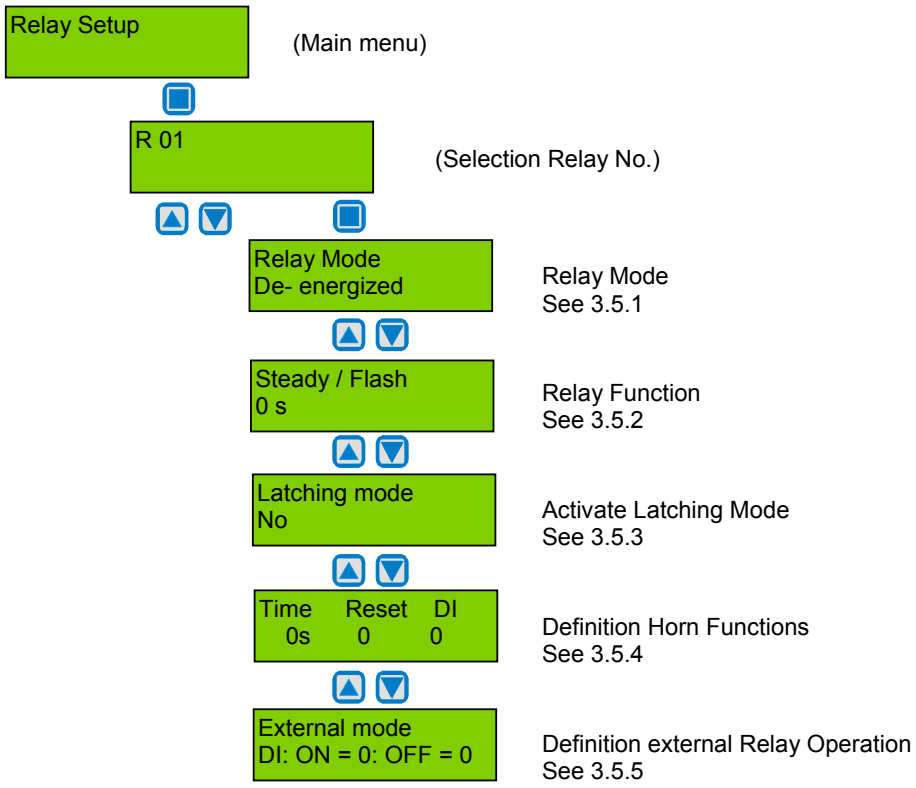
In this menu you can display the current value (CV) and average value (AV) with sensor unit and type for each active sensor point (SP) as well as the define the mode of control (CV or AV mode).



Symbol	Description	Setting Status	Function
SP 01	Sensor Point No.		Select SP No
NH3	Ttype	NH3	See 3.6.2
ppm	Unit		See 3.6.2
CV	Current value	CV	Current value of Gas Concentration
AV	Average value		Average value (10 measured values within the time unit)
*	Control mode		Display, with Control mode is select. (CV or AV)
Not active	SP Status	Not active	SP not announced
Error	SP Malfunction		Current signal < 3 mA or > 22 mA

3.5 Menu Relay Setup

Display and change the parameters for each relay.



3.5.1 Relay Mode

Definition Relay Mode:

Symbol	Description	Setting Status	Function
R 01	Relay No.		Selection Relay
De-energized	Relay Mode	De-energized	De-energized = Stage ON = Relay ON Energized = Stage ON = Relay OFF

3.5.2 Relay Function Steady / Flash

Definition Relay Function

Symbol	Description	Setting Status	Function
R 01	Relay No.		Selection Relay
0	Function	0	0 = Relay Function steady > 0 = Relay Function flashing (= Periods time sec.) Impulse / Break = 1:1

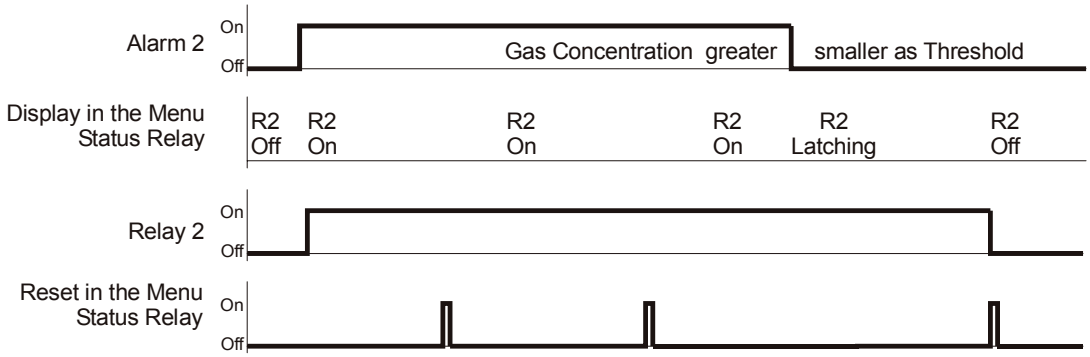
3.5.3 Latching Mode

Definition Latching Function

Symbol	Description	Setting Status	Function
R 01	Relay No.		Selection Relay
No	Latching Mode	No	No = Latching Mode non active Yes = Latching Mode active

Acknowledging of a latching relay in the menu „Relay Status“ is possible only if the sensor value is smaller than the Staged set point including hysteresis. With this condition the status Latching is overlay.

Example: Relay R2 assigned to Latching mode



3.5.4 Horn Function

With this parameter the relay is defined as a horn relay and can be acknowledged with the following possibilities.

- By pressing one of the arbitrary 6 pushbuttons. (Only possible in the starting menu).
- Automatic acknowledging when the time runs out.
- By an external pushbutton. (Assignment appropriate digital input).

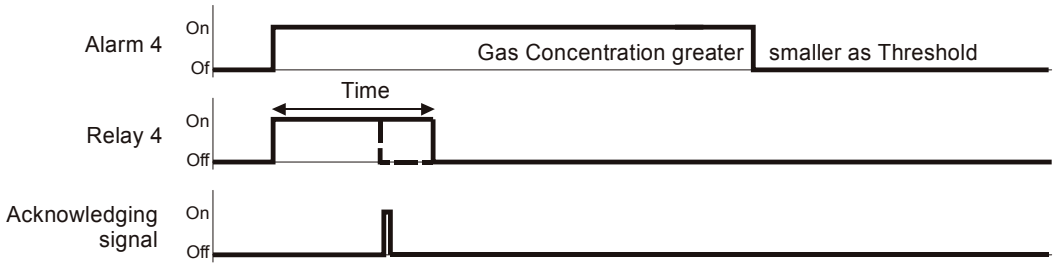
The horn function is activated only if at least one of the two parameters (time or digital input) is set.

Special function Response

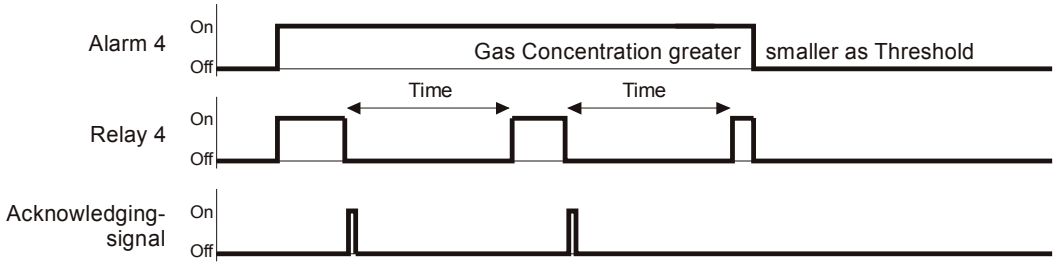
After acknowledging the relay via Pushbutton or external DI the time starts. If this time runs out and if the stage is still exceeded, the relay is energized again..

Symbol	Description	Setting Status	Function
R 04	Relay No.		Selection Relay
Reset	Mode	0	0 = Acknowledge the relay at time run out, or via Pushbutton 1 = Acknowledge the relay over Pushbutton, af time run off and alarm is still acting, relay is set again. (Response function).
Time		120	Time for function Automatic acknowledging or Response function 0 = non acknowledging function
DI		0	Assignment, which digital input acknowledges the relay.

Acknowledge the horn relay



Special function „Response“. (Return of the horn relay)



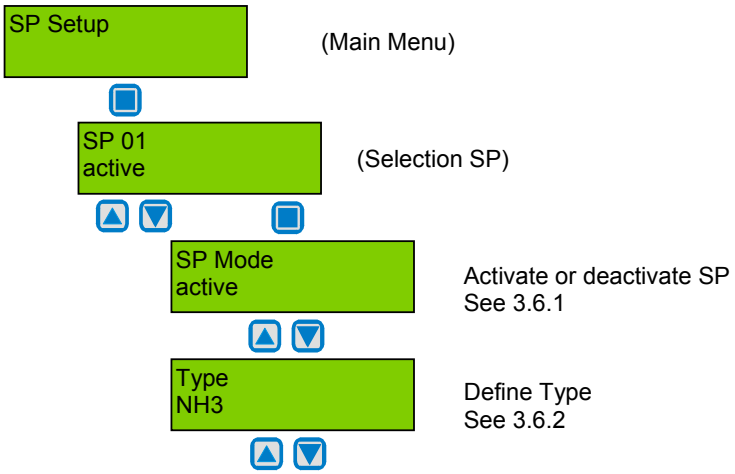
3.5.5 External operation of Relay.

Assign one digital input (DI) for external setting of the relay ON and/or OFF. This function has priority before a stage threshold is exceeded and/or manual switching in the menu „Relay Status“.

Symbol	Description	Setting Status	Function
R 01	Relay No.		Selection Relay
DI-ON	External On	0	If digital input closed, relay switch ON
DI-OFF	External Off	0	If digital input closed, relay switch OFF

3.6 Menu SP Setup

Display and Change Parameters, Assign Stage to relays and activate each Sensor Point (SP).



Measuring range 300 ppm	Define Measuring range See 3.6.3
SP-Signal linear	Adjustment signal form of transmitter See 3.6.4
Threshold 1 100 ppm	Define Stage/Setpoint 1 See 3.6.5
Threshold 2 100 ppm	Define Stage/Setpoint 2 See 3.6.5
Threshold 3 200 ppm	Define Stage/Setpoint 3 See 3.6.5
Threshold 4 200 ppm	Define Stage/Setpoint 4 See 3.6.5 Stage/Setpoint
Threshold 5 300 ppm	Define Stage/Setpoint 5 See 3.6.5
Hysteresis 15 ppm	Hysteresis See 3.6.5
Delay ON time 0 s	Set Delay ON time See 3.6.6
Delay OFF time 0 s	Set Delay OFF time See 3.6.6
C/A Mode CV	Define Control Mode See 3.6.7
Stage - 1 2 3 4 5 Fault - 1 1 0 0 0	Assigned SP Fault to a Stage See 3.6.8
S1; S2; S3; S4; S5; AO 01; 02; 03, 04; 05; 0	Assigned a Stage to a relay Assigned SP to analog output See 3.6.9 and 3.6.10

3.6.1 Activate – Deactivate SP

Symbol	Description	Setting Status	Function
SP 01	Sensor point		Selection SP No. (SP01 is the internal Transmitter)
Active	SP Status	not active	active = Sensor point enabled for reporting not active = Sensor point disabled for reporting

3.6.2 Selection Type

Assign Type to attached to transmitters.

Symbol	Description	Setting Status	Type		Unit	Measuring range[1]
SP 01	Sensor point					.
NH3	Type	NH_3	CO	Carbon monoxide	ppm	0 – 300
			Ex	Combusible Gase	%LEL	0 – 100
			NO	Nitric monoxide	ppm	0 – 50
			NO_2	Nitric dioxide	ppm	0 – 25
			NH_3	Ammonia	ppm	0 – 300
			O_2	Oxygen[2]	%V/V	0 – 25
			CO_2	Carbon dioxide	ppm	0 – 2000
			R11	Refrigerant gase	ppm	0 – 1000
			R123	Refrigerant gase	ppm	0 – 100
			R134	Refrigerant gase	ppm	0 – 1000
			R22	Refrigerant gase	ppm	0 – 1000
			TeSP	TeSPerature	°C	0 – 150
			RH	Humidity	% RH	0 – 100

[1] Range Recommendations for Polygard sensors
[2] During oxygen measurement falling signal!

3.6.3 Measuring range

The measuring range can be defined from 10 to 10000 . The measuring ranges in the above table are typical and only recommendations actual ranges see the sensor manufacturing specifications.

The measuring range must agree with the signal (4 to 20 mA) attached transmitters.
(4 mA = Display=0, 20 mA = Display Measuring range = max. point)

3.6.4 SP Signal

Gas transmitter with electro-chemical - or catalytic bead sensors is linear for gas concentration proportional 4 to 20 mA signal.

Semiconductor gas sensors that are not linear and have a (exponential) signal. This signal leads to a non-linear 4 to 20 mA signal from the gas transmitter.

The Controller LGC/LG2-04 has the capability to monitor both type of gas transmitters, and other linear 4-20 mA sensors. The type of signal is defined in this menu.

Symbol	Description	Setting Status	Function
SP 01	Sensor Point		Selection SP No.
Linear	SP Signal	linear	linear = Transmitter with linear Output signal not linear = Transmitter with non linear Output signal (future).

3.6.5 Stage/Setpoint / Hysteresis

For each sensor point can have five staged set points. If the measured level is greater than the adjusted stage/set point, the associated stage is set. If the level falls below the stage/setpoint plus the hysteresis then the stage returns to original condition.

It is not necessary for stage/set point to be defined at the measuring range end point.

For O_2 measurement on depeletion consider when defining stage setpoints that stages will be set on a falling measuring signal!

Symbol	Description	Default Status		Function
SP 01	Sensor Point			Selection SP No.
100 ppm	Threshold	100 100 200 200 300 15	Stage/setpoint1 Stage/setpoint2 Stage/setpoint3 Stage/setpoint4 Stage/setpoint5 Hysteresis	Sensor Value > Stage/Set point1 = Stage1 Sensor Value > Stage/Set point1 = Stage 2 Sensor Value > Stage/Set point1 = Stage 3 Sensor Value > Stage/Set point1 = Stage 4 Sensor Value > Stage/Set point1 = Stage 5 Sensor Value < (Stage/Set pointX –Hysteresis) = Stage X OFF

3.6.6 Delay time ON or OFF

Delay ON time when Stage is exceeded and/or Delay OFF time when the Stage returns to normal condition.

Symbol	Description	Default Status	Function
SP 01	Sensor Point		Selection SP No.
0 s	Delay Time ON	0	Concentration > Stage Threshold: Relay is only activated at expiration of the defined time (sec.). 0 sec. = No Delay
0 s	Delay Time OFF	0	Concentration < Stage Threshold: Relay is only deactivated at expiration of the defined time (sec.). 0 sec. = No Delay

3.6.7 Control Mode

Definition of the alarm evaluation by Current (CV) or Average value (AV).

Symbol	Description	Default Status t	Function
SP 01	Sensor Point		Selection SP No.
CV	Evaluation	CV	CV = Control the Current value AV = Control the Average value

Current- Average Value Function See: 3.7.4

3.6.8 Assigned SP Fault to Relay

Define, which alarms are activated with a failure at the sensor point.

Symbol	Description	Default Status	Function
SP 01	Sensor Point		Selection SP No.
Alarm - 1 2 3 4 5 Fault - 1 1 0 0 0	Failure SP	1 1 0 0 0	0 = Relay not ON at SP Failure 1 = Relay ON at SP Failure

3.6.9 Assigned Stage to Relay

Each of the 5 alarms can be assigned to a freely selectable alarm relay. Alarms, those not to be needed do not receive assignment.

Symbol	Description	Default Status	Function
SP 01	Sensor Point		Selection SP No.
1	A1 A2 A3 A4 A5	01 02 03 04 00	01 = Stage 1 activate relay R 01 02 = Stage 2 activate relay R 02 03 = Stage 3 activate relay R 03 04 = Stage 4 activate relay R 04 00 = Stage 5 does not activate any relay
0	A	0	0 = SP Signal not assigned to any analog output 1 = SP Signal assigned to analog output 1 X = SP Signal assigned to analog output X

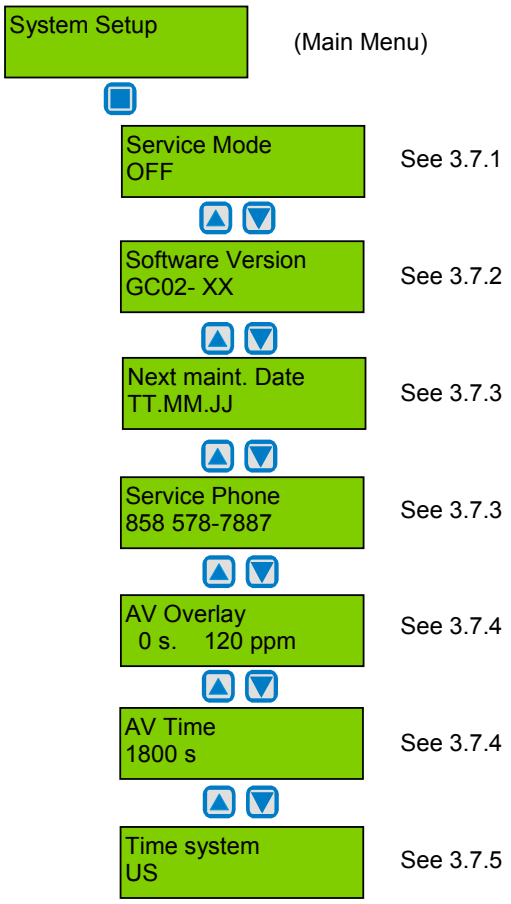
3.6.10 Assigned SP Signal to analog Output

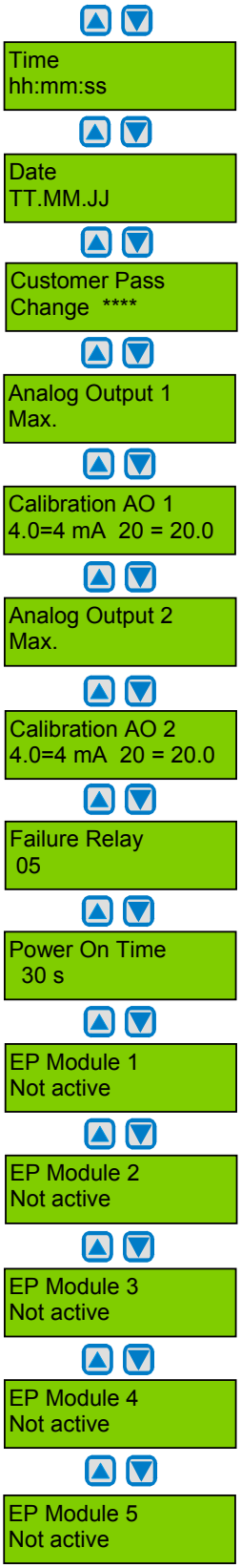
The sensor point signal can be assigned to one of the two analog Outputs. The signal defined in the control mode (current or average value) is transmitted. The assignment occurs in the menu „assignment alarm < > alarm relay" in the right place.

Analog output see also: 3.7.2

3.7 Menu System Setup

Display and change the System Parameters for the Controller





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3.7.1 Service Mode

If the Service mode is set to (ON) then the stage/setpoints exceeded are not passed on to the assigned relays during calibration or service work. The service mode is Reset automatically after 60 minutes or when the service mode is set to off manually.

Symbol	Description	Default Status	Function
Off	Service Mode	Off	Off = Stages exceeded will activate the assigned relays On = Stages exceeded will not activate the assigned relays

3.7.2 Software Version

Symbol	Description	Default Status	Function
GC02-XX	Software Version		XX = Software Version

3.7.3 Maintenance Concept

The LGC/LG2-04 system monitors the maintenance intervals as required, by local Regulations or Customer requirements

During startup and/or after maintenance the date for next maintenance is entered. When reaching this date on the next morning at 9 o'clock the failure signal is activated and in the display the phone No. of the service technician is displayed. The failure signal (maintenance) can be acknowledged by the operator. The maintenance message (Service Phone No.) is reset after maintenance is accomplished and a new maintenance date is entered.

The service phone number can be individually entered in the next menu.

Symbol	Description	Default Status	Function
TT.MM.JJ	Maintenance date		TT.MM.JJ = Input date for next maintenance.
0853....	Phone No.		Input the individual service phone No.

3.7.4 Average Function

The Controller calculates for each active sensing point the arithmetic average value from 10 measurements within the time unit defined in the menu „ AV-time“. This average value is indicated in the menu “Sensor Readings” near the current value. At each Sensor Point the control mode of current value or average value for the Stage/Setpoint evaluation is defined.

The evaluation of the control mode average value is overlaid by the current value, if this exceeds Stage/Setpoint defined in the menu „AV-Overlay”. The overlay is delayed by the time factor set in this menu.

Symbol	Description	Default Status	Function
120 s 120pm	AV- Overlay	120 s 120 ppm	sec. = Delay time average value Overlay. 0 = No overlay Function ppm = Threshold average Overlay
1800 s	AV-Time	1800 s	sec. = Time for calculate average value

3.7.5 Customer Password (Code 1)

Change the System Password for level 1

Symbol	Description	Default Status	Function
1234	Customer-password	1234	1234 = Define the Customer Password with 4 characters

3.7.6 Time, Date

Input and correction of the system time and date. Selection of the time and date format.

Symbol	Description	Default Status	Function
US	Time format	US	EU = Display time and date in EU format US = Display time and date in US format
hh.mm.ss	Time		hh.mm.ss = Input the correct time (EU format) hh.mm.ss am = Input the correct time (US format)
TT.MM.JJ	Date		TT.MM.JJ = Input the correct date (EU format) MM.TT.JJ = Input the correct date (US format)

3.7.7 Analog Output

The Controller has two analog outputs (AO) with 4 to 20 mA signal per control module. Each of the analog outputs can be assigned the signal of one or more sensor points. The assignment occurs in the menu „SP Setup“ for each SP. The sensor point sends the signal that is defined in the menu „C/A Mode“.

The Controller determines from the signal of all assigned sensor points the minimum, the maximum or the average value and sends this value to the analog output. The determination of which value is sent is defined in this menu „Analog Output X“. The analog output can be calibrated with for 4 and 20 mA. In addition the AO can be adjusted with an ampere meter attached (measuring range 25 mA) then respective AO factor can be changed to adjust the analog output 4 and/or 20 mA . During AO calibration no evaluation is made of the sensor point signals. This calibration is factory-set. The factors should only be changed if you have an accurate amp meter.

Symbol	Description	Default Status	Function
Max.	Select Output mode	Max.	Min. = Spends the minimum value of all assigned SP Max. = Spends the maximum value of all assigned SP Average = Spends the average value of all assigned SP
4.0 20.0	Calibration	4.0 20.0	4.0 = Calibration factor at 4 mA 20.0 = Calibration factor at 20 mA

3.7.8 Define the Failure Relay

Define the Failure Relay. See also malfunction management (3.1)

Symbol	Description	Default Status	Function
05	Failure Relay	R05	R05 = Define the failure relay

3.7.9 Power On Time

Sensors need a warm up period, until the chemical process of the sensor reaches a stable condition. During this warm up period the current signal can lead to unwanted false alarm. Therefore the Controller starts reporting after switching on of the power supply and the delay On Time is passed. While this time runs off, the Controller does not report alarms. The power on status is displayed in the display.

Symbol	Description	Default Status	Function
30 s	Power On Time	30 s	XX = Define the Power On Time (sec.)

3.7.10 Activation of expansions modules

The Multi point Controller can have expansions modules; therefore only activate Expansions modules for every four sensor points in addition to the controller module.

4 Mounting / Electrical Connection

The Controller is installed through the 4 marked mounting holes at the back of the housing. These mounting holes are accessible after opening the housing.

The mounting holes are covered with the enclosed caps after the end of the assembly.

Please consider the following when selecting the mounting place:

- Avoid locations where water, oil etc. may influence proper operation and where mechanical damage might be possible.
- Cables are introduced from Topside.
- On the left side to keep at least 150 mm distance to open the transparent door.
- Consider any unusual condition or requirements of the Customer.

4.1 Electrical Connection

Installation must be per local electrical codes with the consideration of the technical requirements of the product.

The alarms are available as SPDT, potential free contacts.

The exact position of the clamps for the alarm relays is to be inferred the following connection diagram.

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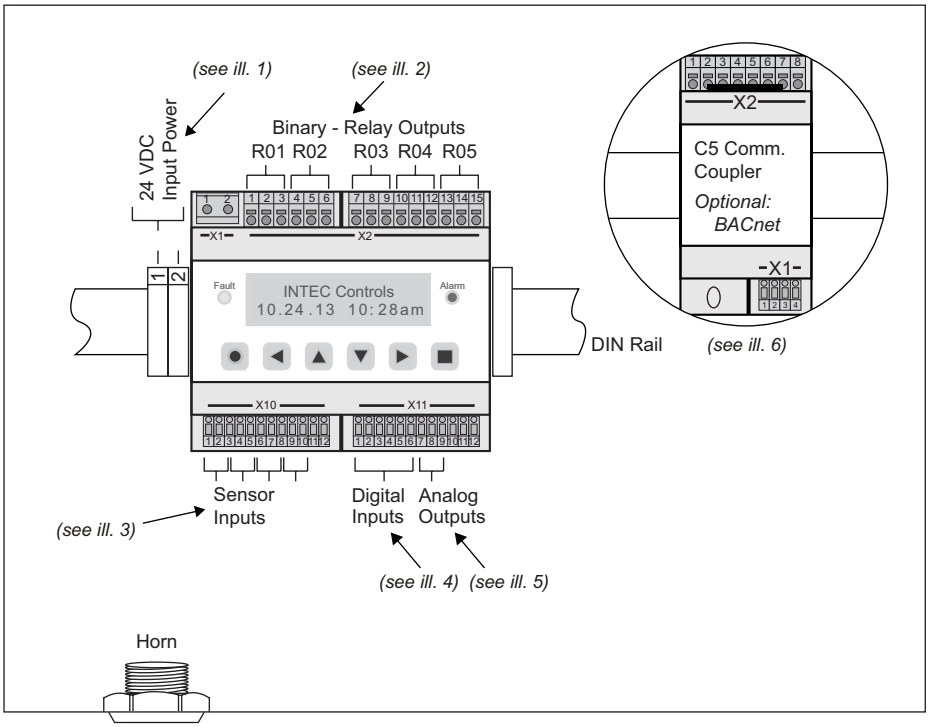
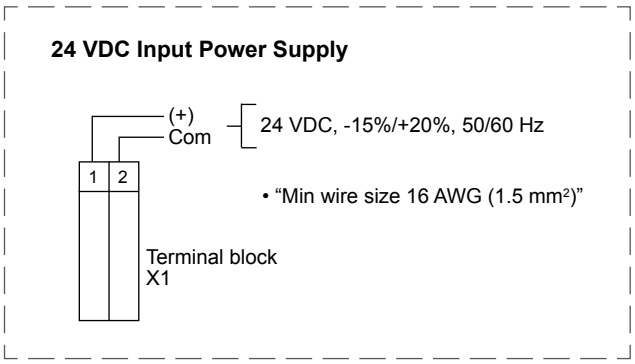
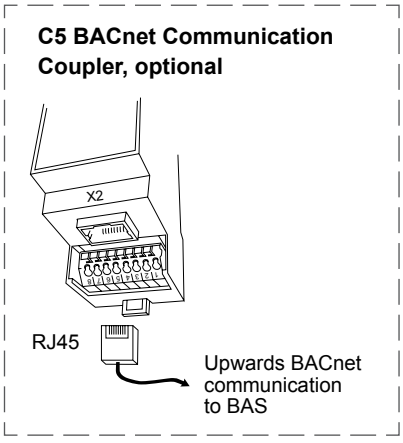
4.2 Unit position – Connection diagram





ill. 1



ill. 6

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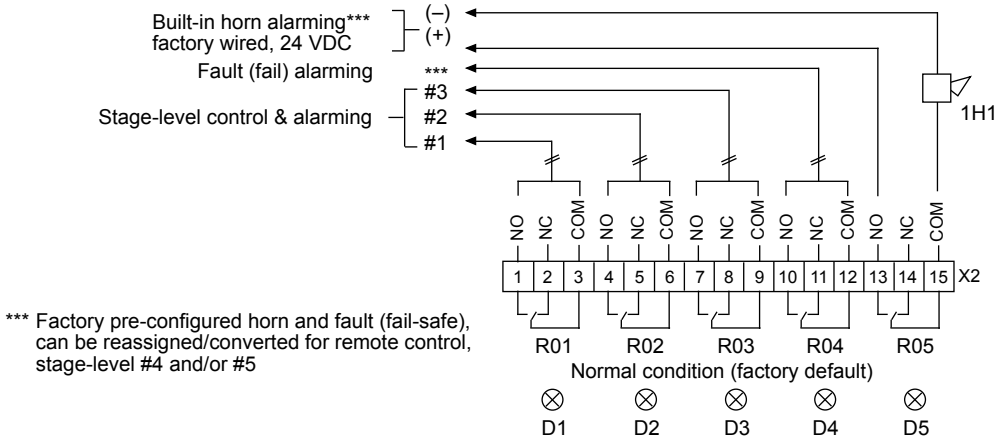
Binary - Relay Outputs “R01 to R05”

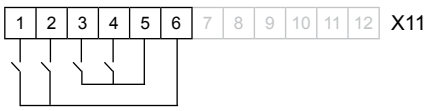

Built-in horn alarming***
factory wired, 24 VDC
(–)
(+)
Fault (fail) alarming
***
Stage-level control & alarming
#3
#2
#1
1H1
NO NC COM NO NC COM NO NC COM NO NC COM NO NC COM
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 X2
R01 R02 R03 R04 R05
Normal condition (factory default)
D1 D2 D3 D4 D5

*** Factory pre-configured horn and fault (fail-safe), can be reassigned/converted for remote control, stage-level #4 and/or #5

⊗ = Relay status LEDs D1 to D5 located below terminal connection of sensor inputs (X10)

ill. 2

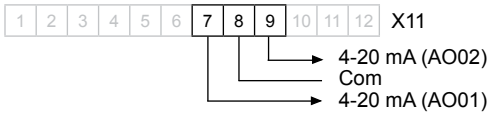
Digital Inputs “DI01 to DI04”



ill. 3

ill. 4

Analog Outputs “AO01 to AO02”



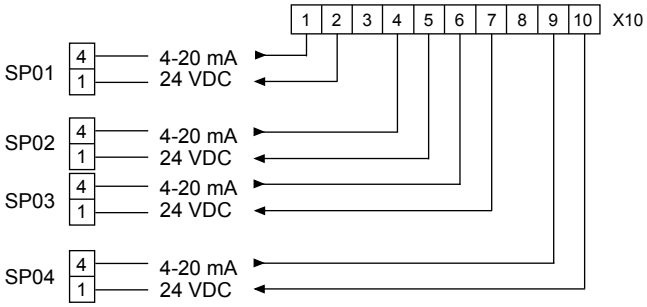
4-20 mA signal
to remote control or BAS,
selectable low, high or
averaging of (4) analog (sensor)
inputs, 500 Ω max. load

The current signal is sourced
by the LGC2 system

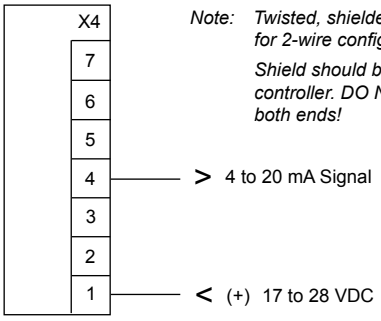
ill. 5

ill. 6, see previous page

Sensor Inputs “SP01 to SP04”



Remote CO sensor/transmitter “SP”



Note: Twisted, shielded wire is recommended for 2-wire configurations.

Shield should be grounded only at the controller. DO NOT ground shield at both ends!

Note: Sensor inputs other than AT Series Transmitters with a power consumption of greater than 55 mA requires a separate DC power supply.

5 Start-up Operation

5.1 Start-up

Before beginning of start-up the wiring of the Controller including all field devices must be completely terminated!

After switching the power supply “ON” and the end of the Power On Time, then the Controller is ready for use.

The electrochemical sensor needs a warm up time of 1 hour.

The Controller is delivered with standard parameters and stages/set points. The assignment of the relays to the individual stages must occur with start-up unless arrangements have been made with the factory for programming. All other parameters are to be examined and adapted to the local conditions.

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5.2 Checklist Start-up operation

System Setup

Parameters	Finish
Time and Date	
Parameter Average Function	
Password level 1 (Customer Password)	
Function analog output	
Define failure relays	
Power On Time	
Service Phone No.	
Maintenance date	

Relay Setup

Parameters	Finish				
Relay R	1	2	3	4	5
Relay Mode					
Function Steady / Flash					
Latching Mode					
Horn function					
External Relay operation					

SP Setup

Parameters	Finish			
SP No.	1	2	3	4
SP Mode				
Type				
Measuring range				
SP- Signal				
Stage/Setpoint 1				
Stage/Setpoint 2				
Stage/Setpoint 3				
Stage/Setpoint 4				
Stage/Setpoint 5				
Hysteresis				
Delay ON time				
Delay OFF time				
C/A Mode				
Assigned Failure <> Stage				
Assigned Stage<> Relay				

6 Configuration- and Parameter card

Commission:		Project No.		
Customer:				
Start-up - company				
Start-up - date:		Service Technician		

6.1 Configurations System Setup

Service	Software Version	Mainten-ance date	Service Phone	AV- Overlay			Time system	Costumers pass	Power On Time	Failure Relay
				ppm	Time	AV-Time				
Default	15	06.06.06	858 578-7887	120	120	1800	US	1234	30 s	5

Analog output 1			Analog output 2		
	Calibration			Calibration	
Mode	= 4	= 20	Mode	= 4	= 20
Max.	4.0	20.0	Max.	4.0	20.0

6.2 Relay Setup

Relay No.	Mode	Steady Flash	Latching mode	Horn Function			External	
							ON	OFF
				Time	Reset	DI	DI	DI
Default	Energezid	0 s	No	0	0	0	0	0
R01								
R02								
R03								
R04								
R05								

6.3 Sensor Setup

SP No.	SP Status	Type	Measuring range	SP-Signal	Stage/Setpoints					Hyst	Delay time (sec.)		CV/AV
					S1	S2	S3	S4	S5		ON	OFF	
Default	Not active	NH3	300	Linear	100	100	200	200	300	15	0	0	AV
01													
02													
03													
04													

Assigned SP fault < >Stage					Assigned Stage/Setpoint<> Relay					AO
S1	S2	S3	S4	A5	S1	S2	S3	S4	S5	
1	1	0	0	1	R1	R2	R3	R4	R5	0

7 Specifications LGC/LG2-04

Carbon Monoxide (CO) Detection and Control System Package			
Controller	**Sensor(s)/Transmitter(s)**		**Part Numbers**
Digital programmable menu-driven keypad user interface LCD & LEDs, 24 VAC/VDC, NEMA 4X enclosure Inputs: (4) 4-20 mA Outputs: (5) Relays, SPDT, 8 A (2) 4-20 mA Built-in (1) Horn	Sensor range: 0-250 ppm CO, 4-20 mA, 2-wire, loop powered 24 VDC, NEMA 12 wall mount enclosure	Incl. (1) CO remote sensor	**LGC-CO-01**
		Incl. (2) CO remote sensors	**LGC-CO-02**
		Incl. (3) CO remote sensors	**LGC-CO-03**
		Incl. (4) CO remote sensors	**LGC-CO-04**
Factory configured CO alarm levels/setpoints: • Low alarm @ 50 ppm (relay #01) • High alarm @ 100 ppm (relay #02) • Horn alarm @ 100 ppm (relay #05) Other setpoints/programming are available on special request. All devices are field programmable and adjustable.			

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SPECIFICATIONS

Electric	
Power supply	
- controller	24 VAC/VDC, -15%/+20%, 50/60 Hz, auto-resettable fuse
- sensor(s)/transmitter(s)	24 VDC from controller, loop powered, polarity protected
Power consumption	13 VA (0.5 A), w/max sensor connections
RF/EMI protected	4.0 W @ 3 ft. (1 m) radiated
Sensor Performance	
Gas detected	Carbon monoxide (CO)
Sensor element	Electrochemical, diffusion
Range	Span field adjustable from 0-150 to 0-300 ppm via calibration, 0-250 ppm factory set
Resolution	± 3.0 ppm of reading
Repeatability	± 3.0% of reading
Long term output drift	< 0.42% signal loss/month
Response time	t_{90} < 50 sec.
Sensor life expectancy	5 years, normal operating environment
Sensor coverage	5,000 sq.ft., max. 10,000 sq.ft. (465 m^2, max. 930 m^2), under "ideal conditions"
Installation Location	
Sensor mounting height	5 to 6 ft. (1.5 to 1.8 m) above floor
Type of Control	
General	Five-stage (S1 to S5) control, assignable up to five (5) binary/ relay output, i.e. Low-med-high-fault/fail-horn*, or low1-low2-med1-med2-high, or any other combinations (* = horn/audible alarm built-in and factory pre-configured to relay output "R05")
Analog inputs	Four (4) 4-20 mA, for remote sensors
Analog reading	Current and mean (average) value
Stage level / setpoint	Field adjustable over full range, five (5) per analog input, assignable to current or mean (average) value
- hysteresis/ switching differential	Selectable for each sensor point
Digital inputs	Four (4), each can be individually assigned to any relay (R1...R5). Digital inputs are used for remote audio/visual alarm reset
Relay outputs (R1-R5) w/ status LEDs	Five (5) SPDT, 8A 24 VAC/VDC-250 VAC contact resistance 100 mΩ, max.
- each stage level (S1-S5)	Assignable to any relay
- sensor fail-safe	Assignable to any stage level
Time delay switching	Selectable for make and brake of each sensor point (SP1 to SP4) 0-9,999 seconds
Analog output	Two (2) independent 4-20 mA signal, 500 Ω max. load, selectable as low, high or averaging of sensor inputs
Audible alarm	90 db, enabled or disabled, selectable; assignable to stage level S1, S2, S3, S4 or S5
Alarm acknowledgement	Menu-driven and system reset function for latched relays
User Interface	
Keypad type	Refer to "illustration keypad user interface"
Touch buttons	Six (6)
Status LED's	Yellow: Alarm Red: Fault (fail)
Digital display	Liquid Crystal Display (LCD), two lines, 16 characters per line, 1 digit resolution, backlit
- unit display	Menu selectable, per sensor
Environmental	
Permissible ambient controller	
- working temperature	23°F to 104°F (-5°C to 40°C)
- storage temperature	23°F to 86°F (-5°C to 30°C)
- humidity	15 to 95% RH, non-condensing
Permissible ambient sensor/transmitter	
- working temperature	14°F to 122°F (-10°C to 50°C)
- intermitted temperature	-4°F to 122°F (-20°C to 50°C)
- storage temperature	41°F to 86°F (5°C to 30°C)
- humidity, continuous	15 to 90% RH, non-condensing
- humidity, intermitted	0 to 99% RH, non-condensing
- working pressure	Atmospheric ± 10%

SPECIFICATION

Physical, Controller	
Enclosure (panel)	
- material	Polycarbonate, impact resistance EN 50102/IK08, flammability rating UL 94-5V
- conformity	UL Type 1, UL508 standards
- color	Light gray, smoked gray for cover
- protection	NEMA 4X (IP 65)
- installation	Wall (surface) mounted
Dimensions (H x W x D)	
- base	7.9 x 7.5 x 4.1 in. (200 x 190 x 105 mm)
Cable entry	5 holes for 1/2 in. conduit, covered
Wire connection	Terminal blocks, Push-on connect and screw type for lead wire
Wire size	
- input	Min. 22 AWG (0.34 mm²) Max. 16 AWG (1.50 mm²)
- output	Min. 24 AWG (0.25 mm²) Max. 14 AWG (2.50 mm²)
Weight	4.5 lbs. (2.0 kg)
Physical, Sensor/Transmitter	
Enclosure, standard	
- material	Heavy duty Polycarbonate, UL-94-V2, fire-retardant
- color	Light gray
- protection	NEMA 12 (IP 55)
- installation	Wall (surface) mounted, or single gang electrical box
Dimensions (H x W x D)	5.0 x 3.4 x 2.2 in. (127 x 87 x 56 mm)
Cable entry	1 hole for 1/2 in. conduit for wall (surface) mounting and 1 hole on back side of base plate for single gang electrical box mounting
Wire connection	Terminal blocks, screw type for lead wire
Wire size	Min. 24 AWG (0.25 mm²), Max. 14 AWG (2.5 mm²)
Wire distance	Max. loop resistance 500 Ω (= wire resistance plus controller input resistance)
Weight	0.6 lbs. (0.25 kg)

Approvals / Listings	
- controller and sensor/transmitter	City of Los Angeles Approved (pending) CE VDI 2053, C-No. 418791 EMV-Compliance 89/336/EWG
- sensor	UL Recognized
- relays (R1-R5)	UL Recognized, E5610 & E108658 CSA, C22.2 No. 14, LR35579 VDE
- controller enclosure	UL Listed, E75645

8 Notes and General Information

It is important to read user manual thoroughly and clearly understand the information and instructions. The PolyGard® LGC/LG2-04 monitoring, control and alarm system must be used within product specification capabilities. The appropriate operating and maintenance instructions and recommendations must be followed.

Due to ongoing product development, MSR reserves the right to change specifications without notice. The information contained herein is based upon data considered to be accurate. However, no guarantee is expressed or implied regarding the accuracy of this data.

8.1 Intended product application

The PolyGard® LGC/LG2-04 are designed and manufactured for control applications for energy savings and OSHA air quality compliance in commercial buildings and manufacturing plants (i.e., detection and automatic exhaust fan control for automotive maintenance facilities, enclosed parking garages, engine repair shops, warehouses with forklifts, fire stations, tunnels, etc.).

8.2 Installers` responsibilities

It is the installer's responsibility to ensure that all PolyGard® LGC/LG2-04 are installed in compliance with all national and local codes and OSHA requirements. Installation should be implemented only by individuals familiar with proper installation techniques and with codes, standards and proper safety procedures for control installations and the latest edition of the National Electrical Code (ANSI/NFPA70). It is also essential to strictly follow all instructions as provided in the user manual.

8.3 Maintenance

It is recommended that the PolyGard® LGC/LG2-04 performance check is done on a routine schedule. Any performance deviations may be serviced based on needed requirements.

8.4 Limited warranty

MSR-Electronic-GmbH and IN*TEC* Controls warrants the PolyGard® LGC/LG2-04 for a period of two years, 12 months normal exposure for the sensor, from the date of shipment against defects in material or workmanship. Should any evidence of defects in material or workmanship occur during the warranty period, IN*TEC* Controls will repair or replace the product at their own discretion, without charge.

This warranty does not apply to units that have been altered, had attempted repair, or been subject to abuse, accidental or otherwise. The warranty also does not apply to units in which the sensor element has been overexposed or gas poisoned. The above warranty is in lieu of all other express warranties, obligations or liabilities.

This warranty applies only to the PolyGard® LGC/LG2-04. MSR-Electronic-GmbH and/or IN*TEC* Controls shall not be liable for any incidental or consequential damages arising out of or related to the use of the PolyGard® LGC/LG2-04.

If the PolyGard® LGC/LG2-04 needs to be returned to IN*TEC* Controls for service, an RMA number must be obtained prior to sending.

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